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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/988,706	11/20/2001	Kazunori Numata	2001_1727A	9132

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EXAMINER	
SINGH, DALZID E	
ART UNIT	PAPER NUMBER
2613	

DATE MAILED: 04/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/988,706	NUMATA ET AL.	
	Examiner	Art Unit	
	Dalzid Singh	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 February 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims 1 and 3 recite "a first given value" and "a second given value" These values are not defined. On page 20 of the specification, equation (6) defines relationship between numerical aperture of the optical signal (NA_{in}) and numerical aperture of the multi-mode fiber (NA_f). For example, the claim could be written to recite "...numerical aperture of the optical signal is equal to less than numerical aperture of the multi-mode fiber..." Furthermore, it is not clear how power of the optical signal is defined.

The claims 6 and 8 recite "a given value" It is unclear what represent the given value since it is not defined.

Claim 9 recite "a first given value" , "a second given value" and "a third given value" It is unclear what represent the given value since it is not defined.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forrest et al (US Patent No. 4,709,413) in view of Marcuse et al (US Patent No. 5,699,464) and further in view of Kaneko et al (US Patent No. 4,815,807).

Regarding claim 1 (as far as understood), Forrest et al disclose an optical transmission system (fig. 2) for transmitting an optical signal from terminal (10) (including transmitter (16), col. 3, lines 11-15) to a terminal (12, including detector (22), col. 3, lines 20-23) through a multi-mode fiber (col. 3, line 34), wherein the terminal (transmitter) (10) comprises:

a light emission element (16, col. 3, line 18) for generating an optical signal; and

at least one lens ((30), col. 4, line 33-35) for converging the optical signal generated by the light emission element to focus at a focal point (col. 4, lines 36-39). wherein:

the optical signal converged by the at least one lens (such 30, see fig. 2) enters an input plane of the multi-mode fiber (14) to propagate through the multi-mode fiber (col, 3, lines 63-67), and is outputted from an output plane of the multi-mode fiber at the other end (end at 12);

a receiver (such terminal 12, col. 3, lines 20-23) comprising a light receiving element (22) for receiving the optical signal outputted from the multi-mode fiber (14), wherein

an optical axis of said at least one lens is aligned with a fiber axis of the multimode fiber (fig. 2 and col. 4, lines 36-44; it would have been obvious that the optical axis of the lens is aligned to the fiber in order to maximized transfer of optical signal).

Forrest et al disclose optical transmission system as discussed above and differ from the claimed invention in that Forest et al do not specifically disclose a vertex of said at least one lens is located at a first predetermined distance from the input plane of the multi-mode fiber, the first predetermined distance being greater or less than a distance from the vertex of said at least one lens to a focal point of said at least one lens. However, arranging proper placement of the lens with respective to the multi-mode fiber optical cable is well known. Marcuse et al is cited to show such well known concept. In Fig. 6, and col. 3, lines 54-67 to col. 4, lines 1-25, Marcuse et al teach placement of the lens (62) with respect to the fiber (60). In such arrangement a point on the outer surface of the lens can be considered as the vertex of the lens, which has a predetermined distance (the predetermined distance is slightly greater than Dm, shown by the end point of the arrow (R)) from input plane of the fiber (the input of the plane of the fiber is the end of the fiber). Marcuse et al show that the first predetermined distance being is greater than the distance from the vertex of said at least one lens to a focal point of said at least one lens (Fr). Therefore, it would have been obvious to an

artisan of ordinary skill in the art at the time the invention was made to arrange such placement of the lens with respect to the fiber. One of ordinary skill in the art would have been motivated to do such in order to maximize coupling efficiency.

Furthermore, the combination of Forrest et al and Marcuse et al differs from the claimed invention in that the combination does not disclose the predetermined distance is selected based on an eye opening factor of the multi-mode fiber and a power of the optical signal. However, it is well known to select such predetermined distance based on a measured value. One of the value of such measurement is power of the optical signal. Kaneko et al is cited to show such well known concept. In Fig. 7 and in col. 5, lines 36-47, Kaneko et al disclose coupling of optical fiber to the lens separated by predetermined distance (l) in which power the light is measured by the use of power meter. Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to select predetermined distance based on power of the signal. One of ordinary skill in the art would have been motivated to do this in order to determined suitable distance in order to decrease or eliminate coupling losses and provide maximum coupling efficiency. Furthermore, as indicated by applicant in the specification on page 13, lines 10-13, eye opening factor is measured using power meter. Therefore, it would have been obvious to an artisan of ordinary skill to utilize the power meter of Kaneko et al to measure eye opening factor of the optical signal. One of ordinary skill in the art would have been motivated to do this in order to obtain more information regarding quality of the measured optical signal.

Regarding claim 2, Forrest (fig. 2) shows the input plane (of fiber 14) is placed at a position farther away from the at least one lens than the focal point.

Regarding claim 3 (as far as understood), Forrest discloses an optical transmission system (fig. 2) for transmitting an optical signal from terminal (10) (including transmitter (16), col. 3, lines 11-15) to a terminal (12, including detector (22), col. 3, lines 20-23) through a multi-mode fiber (col. 3, line 34), wherein the terminal (transmitter) (10) comprises:

a light emission element (16, col. 3, line 18) for generating an optical signal; and

at least one lens (30, col. 4, line 33-35) for converging the optical signal generated by the light emission element to focus at a focal point (col. 4, lines 36-39). wherein

the optical signal converged by the at least one lens (such 30, see fig. 2) enters an input plane of the multi-mode fiber (14) to propagate through the multi-mode fiber (col, 3, lines 63-67), and is outputted from an output plane of the multi-mode fiber at the other end (end at 12); and,

an optical axis of said at least one lens is aligned with a fiber axis of the multimode fiber (fig. 2 and col. 4, lines 36-44; it would have been obvious that the optical axis of the lens is aligned to the fiber in order to maximized transfer of optical signal).

Forrest et al disclose optical transmission system as discussed above and differ from the claimed invention in that Forest et al do not specifically disclose a vertex of said at least one lens is located at a first predetermined distance from the input plane of

the multi-mode fiber, the first predetermined distance being greater or less than a distance from the vertex of said at least one lens to a focal point of said at least one lens. However, arranging proper placement of the lens with respective to the multi-mode fiber optical cable is well known. Marcuse et al is cited to show such well known concept. In Fig. 6, and col. 3, lines 54-67 to col. 4, lines 1-25, Marcuse et al teach placement of the lens (62) with respect to the fiber (60). In such arrangement a point on the outer surface of the lens can be considered as the vertex of the lens, which has a predetermined distance (the predetermined distance is slightly greater than Dm, shown by the end point of the arrow (R)) from input plane of the fiber (the input of the plane of the fiber is the end of the fiber). Marcuse et al show that the first predetermined distance being is greater than the distance from the vertex of said at least one lens to a focal point of said at least one lens (Fr). Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to arrange such placement of the lens with respect to the fiber. One of ordinary skill in the art would have been motivated to do such in order to maximize coupling efficiency.

Furthermore, the combination of Forrest et al and Marcuse et al differs from the claimed invention in that the combination does not disclose the predetermined distance is selected based on an eye opening factor of the multi-mode fiber and a power of the optical signal. However, it is well known to select such predetermined distance based on a measured value. One of the value of such measurement is power of the optical signal. Kaneko et al is cited to show such well known concept. In Fig. 7 and in col. 5, lines 36-47, Kaneko et al disclose coupling of optical fiber to the lens separated by

predetermined distance (l) in which power the light is measured by the use of power meter. Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to select predetermined distance based on power of the signal. One of ordinary skill in the art would have been motivated to do this in order to determined suitable distance in order to decrease or eliminate coupling losses and provide maximum coupling efficiency. Furthermore, as indicated by applicant in the specification on page 13, lines 10-13, eye opening factor is measured using power meter. Therefore, it would have been obvious to an artisan of ordinary skill to utilize the power meter of Kaneko et al to measure eye opening factor of the optical signal. One of ordinary skill in the art would have been motivated to do this in order to obtain more information regarding quality of the measured optical signal.

Regarding claim 4, Forrest (fig. 2) shows the input plane (of fiber 14) is placed at a position farther away from the at least one lens than the focal point.

Regarding claim 5, Forrest (fig. 2) shows element (22) (in associated with hole (74), col, 4, lines 42-44) as a receptacle for connecting to the multi-mode fiber to affix the input plane (of fiber) at a position other than the focal point.

Allowable Subject Matter

4. Claims 6, 8 and 9 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

Response to Arguments

5. Applicant's arguments with respect to claims 1 and 3 have been considered but are moot in view of the new ground(s) of rejection.

6. Applicant's arguments filed 03 February 2006 have been fully considered but they are not persuasive.

Applicant argues the references individually, however, the rejection was made with combination of references. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalzid Singh whose telephone number is (571) 272-3029. The examiner can normally be reached on Mon-Fri 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DS
April 15, 2006
David Singh